

THE SPHÆRIDIINÆ OF THE PACIFIC COAST

Coleoptera, Hydrophilidæ

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This paper is intended to include all the species of the subfamily Sphæridiinæ recorded from the Pacific Coast of North America from Alaska to Lower California. Its purpose is to enable persons who do not have access to Horn's revision¹ or who have not the time for a careful study of the group to determine their specimens as easily and accurately as possible. There are also several additions and corrections to Horn's work which have been published recently or which have been noticed during the preparation of this paper which are included here.

The synonymy of the group is not yet perfectly worked out, but the recent corrections by Fall² have definitely settled the status of several of our species. A careful study of the detailed description of *Cercyon californicus* Fall³ convinces me that it is the same thing that was described in 1922 by Knisch⁴ from "California." The descriptions agree in every detail and it is very likely that Fall had not seen Knisch's paper. A comparison of types would settle the matter, but I have not been able to find any type material of *C. kulzeri* in this country. The California Academy of Sciences has specimens from the type locality of *C. californicus* which are probably typical.

Considerable trouble has been experienced in the use of Horn's key to the species of *Cercyon*. Some of the characters there used are obscure, and a few are definitely incorrect. In some species the central elevated area of the metasternum is extended laterally and anteriorly by a raised line curving outwards toward the anterior angle on each side. The extent of this area is limited unless the line is definite and distinct and reaches at least nearly to the front angle. All the species of *Cercyon* have the prothorax laterally margined by an impressed line. In some species this line extends around the posterior angles and along the base. The presence or absence of this basal

¹ Horn, G. H. Rev. of Sphæridiinæ of U. S., Trans. Am. Ent. Soc., XVII, 1890, pp. 280-312.

² Fall, H. C. Notes on *Cercyon*, Psyche, XXXI, 1924, pp. 247-253.

³ Psyche, XXXI, 1924, pp. 251-252.

⁴ Knisch, Archiv. fur Naturg., LXXXVIII, 1922, A (5), pp. 97-100.

line is an important character and one over which Horn made several mistakes. *C. lateralis* does have the line extended slightly past the hind angles, but it is often obscure and visible only from directly behind the prothorax. In some species the marginal line is very clear, extending well along the base, but in others it is very short, barely passing the hind angles.

Very free use of Horn's revision has been made in preparing this paper. The key to genera is taken from that work and most of the descriptions are adapted and abridged from his descriptions. The key to *Cercyon* has been completely rewritten, as the older one was unsatisfactory.

Several of the species reported by Horn from this coast have not since been recorded. Some of these may be the result of errors; all are, however, included here. All new localities are represented in the collection of the California Academy of Sciences.

Mr. E. P. Van Duzee of the California Academy of Sciences in San Francisco has very kindly allowed me to use the specimens in the collection of that institution and Messrs. Chas. Liebeck and H. C. Fall have greatly aided me by loaning specimens of several species of *Cercyon*. Dr. E. C. Van Dyke of the University of California has been most generous with his time, material, library, and advice and has helped me to settle several of the more difficult points.

Subfamily SPHÆRIDIINÆ

Small, terrestrial Hydrophilidæ, living in various kinds of decomposing vegetable matter. Generally oval and more or less convex; brown or black with the elytra frequently tipped with yellow, and usually with ten striæ or rows of punctures. Antennæ 9-segmented, first segment of middle and posterior tarsi elongated.

Three hundred and forty-six species, belonging to fifty genera, have been described from all over the world. Of these genera ten are known from North America and five from the Pacific Coast.

KEY TO PACIFIC COAST GENERA OF SPHÆRIDIINÆ

1. Elytra extended below the lower surface of body, epipleuræ in great part vertical; metasternal side pieces wide. (Cyclo-noti.) *Dactylosternum*

- Elytra not extended 2
2. Elytra not inflexed, epipleuræ horizontal, distinct; metasternal side pieces moderate in width, parallel; prosternum carinate at middle. (Cercyones.) 3
- Elytra inflexed, clasping the sides of the body, without distinct epipleuræ; metasternal side pieces narrow, partly covered by the inflexed elytra; prosternum elevated at middle, forming an area. (Megasterni.)..... 4
3. Scutellum elongate; pygidium visible.....*Sphæridium*
Scutellum equilateral; pygidium covered*Cercyon*
4. Lateral margin of prothorax not inflexed.....*Megasternum*
Lateral margin of prothorax angularly inflexed; anterior tibiæ entire *Cryptopleurum*

Group CYCLONOTI

Metasternum prolonged between the middle coxæ, closely united with the mesosternal elevation, the suture always distinct, and often impressed.

Genus DACTYLOSTERNUM Wollaston

Prosternum strongly carinate, not notched behind to receive point of mesosternum. Metasternum prolonged in a process completely separating the middle legs, the episternum wide and suture straight; mesosternum elevated in front of the metasternal process, usually in the form of an arrow-head, the suture between the two sterna well marked. First ventral abdominal segment distinctly carinate at middle.

DACTYLOSTERNUM CACTI Lec.

Antennæ pale testaceous with brownish club. Head closely punctate, more finely in front. Thorax closely and equally, but not coarsely punctate. Elytra punctulate, a little more coarsely but less closely than the thorax, the striæ replaced by rows of punctures, these rather coarser and deeper at the sides, sutural stria distinctly impressed on its apical half. Body beneath piceous or brownish, opaque. Prosternum carinate, the carina elevated in front. Legs pale piceo-rufous. Length .20 to .24 inches (5 to 6 mm.).

This is the only species recorded from the Pacific Coast. It occurs in southern California and Arizona in decomposing cactus of the more massive forms (*Cereus*, etc.). Taken in Los Angeles County, by Dr. E. C. Van Dyke. Rather rare in southern California, more abundant in Arizona.

Group CERCYONES

Metasternum not at all, or extremely little extended between the middle coxæ. Prosternum moderately wide in front of the coxæ and carinate at middle. First ventral segment distinctly carinate. Elytra with distinct lateral edge, the epipleuræ distinct and horizontal. Metasternal side pieces of moderate width, the sides parallel.

Two genera are known from this coast. They may be separated by means of the foregoing table.

Genus SPHÆRIDIDIUM Fabr.

Fifteen species of Sphærididium are known. The genus occurs in almost every part of the world. Only two are found in North America, and one in our territory.

SPHÆRIDIDIUM SCARABÆOIDES L.

Oval or subglobose, convex. Above black, shining; elytra with a reddish subbasal spot and the apical fourth yellowish; beneath piceous, the femora spotted with paler. Thorax and elytra finely and evenly punctured, the latter without striæ. Length, 5.5 to 6.5 mm.

Occurs throughout the United States and much of Canada. A cosmopolitan species. Recorded first from North America about 1880, from the Northwest about 1913, and from California in 1920 (Van Dyke).

Genus CERCYON Leach

Prosternum scarcely separating the anterior coxæ, the median line carinate in a variable degree. Mesosternum elevated between and in front of the middle coxæ, the suture between the meso- and metasterna being always well marked. Tibiæ spinulose on their outer edge, the front tibiæ entire on the outer edge. Metasternum does not project between the middle coxæ.

This genus is world-wide in distribution. One hundred and twenty-one species are recorded, of which probably more than twenty-five are from North America and sixteen from the Pacific Coast. They are found in dung and other decomposing matter.

KEY TO PACIFIC COAST SPECIES OF CERCYON

1. Elytral striæ deeply impressed from base to apex, intervals slightly convex.....*fimbriatus* Mann.
Elytral striæ not deep; intervals flat..... 2
2. Metasternal area extended by an oblique line directed toward the anterior angle..... 3
Metasternal area limited to middle of metasternum..... 6

3. Lateral marginal line of prothorax extended, at least slightly, along the base *nigriceps* (Marsh.)
Lateral marginal line not distinctly extended along base..... 4
4. Undersurface shining, not opaque; mesosternal elevation longitudinally sulcate; striæ replaced by rows of punctures *navicularis* Zimm.
Undersurface opaque; mesosternal elevation flat; striæ impressed 5
5. Elytral intervals densely punctulate, at least on disk; epipleuræ pale..... *hæmorrhoidalis* (Fabr.)
Elytral intervals indistinctly punctate; elytra reddish, with a large scutellar triangle and humeral stripe piceous.....
..... *pygmæus* (Ill.)
6. Elytral striæ replaced by rows of punctures; body very convex 7
Elytral striæ impressed, at least in part of their length..... 8
7. Upper surface entirely rufescent..... *rufescens* Horn
Color darker; thorax piceous, sometimes with an indistinct pale margin..... *tristis* (Ill.)
8. Mesosternal elevation linear or narrowly lanceolate..... 9
Mesosternal elevation oval, only twice as long as wide; upper surface alutaceous *kulzeri* Knisch
9. Elytral striæ evenly impressed, or more deeply at base..... 10
Elytral striæ decidedly more deeply impressed toward the apex 11
10. Elytral intervals not very distinctly punctulate; prothorax usually with prescutellar impression and distinct impressions opposite the base of the fourth striæ... *lunigerum* Mann.
Elytral intervals distinctly punctate, not alutaceous; ante-basal impressions indistinct..... *marinus* Thoms.
11. Lateral marginal line of prothorax extended at least slightly along the basal margin..... 12
Lateral marginal line reaching the hind angles only. (Variable in *adumbratus*, but never very distinctly extended beyond the angles)..... 13
12. Length, 2 to 3 mm.; elytra reddish brown with tip indefinitely paler *lateralis* (Marsh.)
Length, 1.5 to 2 mm.; elytra yellowish..... *quisquilius* (L.)
13. Prothorax very little longer at middle than at sides; legs piceous; prothorax very faintly paler at sides.....
..... *depressus* Steph.
Prothorax decidedly longer at middle than at sides; legs rufotestaceous; sides of prothorax usually indefinitely but decidedly paler..... 14
14. Elytra alutaceous; less than 2 mm. long..... *opacellus* Fall
Surface shining; 2 mm. or more in length..... 16
15. Elytral intervals closely punctate on the disk... *fulvipennis* Mann.
Elytral intervals not distinctly punctate..... *adumbratus* Mann.

CERCYON DEPRESSUS Steph.

Oval, piceous; elytra testaceous. Head punctate, rather closely at the sides and apex, smoother at middle. Prothorax punctate, but not closely; base of prothorax usually with a prescutellar impression. Elytra striate, tenth stria entirely lacking, striæ deeper toward apex, finely punctate. Legs rufo-piceous. Length 2 to 2.5 mm.

Recorded by Horn from California.

CERCYON FIMBRIATUS Mannerheim

Oval, moderately convex, color variable. Antennæ testaceous, club brownish; palpi piceo-testaceous; body beneath dark brown or black, opaque; legs variable in color. Head always piceous, shining, moderately closely punctate; base of prothorax without marginal line, surface finely and closely punctate at middle, more coarsely and less closely at the sides. Elytra deeply striate, striæ not punctate, tenth stria scarcely evident, intervals moderately convex, finely and closely punctate on the disk, alutaceous at sides and apex without distinct punctures. Length 2.5 to 3 mm.

This species is very variable in color, but is readily distinguished from all others by the heavily impressed striæ and convex intervals. It occurs abundantly under decomposing seaweed on the coast from Alaska to San Diego.

CERCYON LUNGERUM Mannerheim

Piceous, moderately shining, thorax with a small pale spot near the front angle, elytra reddish yellow, with a narrow crescentic transverse space divided by the suture; body beneath opaque, black; legs piceous. Head sparsely indistinctly punctate; surface of prothorax moderately closely punctate, a little more coarsely near the sides. Elytra finely striate, the striæ finely punctate, intervals flat, not very distinctly punctate on the disk, alutaceous at apex and sides with the punctures indistinct. Mesosternal carina long and linear. Length 4 mm.

This is the largest of our species. It is found with the preceding under decomposing seaweed, but distinguished at once by the flat intervals and larger size. Found along the coast from Alaska to Catalina Island.

CERCYON QUISQUILIUS Linnaeus

Oval, piceous, shining, sides of thorax pale, elytra testaceous, sometimes slightly clouded on disk near base; body beneath opaque; legs reddish. Head moderately closely, but not coarsely punctate. Basal marginal line of prothorax distinct at outer third, base with a distinct impression opposite the scutellum, surface moderately closely punctate, less closely at the sides. Elytra ten-striate, striæ rather closely punctate, those of the disk indistinct near base, deeper

near apex, intervals flat, moderately closely punctate on the disk, but much more sparsely at sides and apex. Mesosternal elevation linear. Length 1.5 to 2 mm.

Found in manure from Washington southward into central California. It is also found in Europe, Siberia, and Japan.

CERCYON MARINUS Thomson

Piceous, shining; sides of prothorax bordered with pale, elytra with yellowish testaceous space, well defined, extending along the side very nearly to the humeral angles; epipleuræ piceo-rufous; body beneath opaque black; legs piceo-rufous, the femora darker. Head moderately punctate; prothorax without lateral marginal line, disk more coarsely and closely punctured than the head. Elytra ten-striate, striæ punctate, and indistinct at apex; intervals flat, closely punctate, more sparsely near apex and coarser at sides; mesosternal elevation very narrowly lanceolate. Length 2.5 to 3 mm.

Taken in Lassen County, California, by J. O. Martin.

CERCYON FULVIPENNIS Mannerheim

Oval, piceous black, shining, sides of thorax pale, elytra brownish or piceo-testaceous, sides and apex somewhat paler; body beneath black, opaque; legs rufous. Head rather coarsely and moderately closely punctate. Thorax punctured similarly to the head, basal marginal line wanting. Elytra ten-striate, the tenth stria represented by a row of punctures, striæ moderately deeply impressed, rather more so at sides and apex, rather closely punctate, and more coarsely at the sides, intervals flat, closely punctate on the disk. Length 2.5 to 3 mm.

Differs from *lateralis* in the absence of the basal marginal line of prothorax. Common in excrementitious matter from Alaska southward to central California.

CERCYON LATERALIS Marsham

Oval, piceous black, shining, sides of thorax pale, elytra reddish brown, apex somewhat paler; body beneath black opaque; legs rufo-testaceous. Head moderately punctate; base of prothorax without definite prescutellar impression, lateral marginal line extending slightly past anterior angles and along the base, surface moderately, not closely punctate, although a little variable. Elytra striate, striæ closely punctate, deeper near the apex, intervals flat, more convex at apex, closely punctate, but more sparsely near the apex, tenth stria not impressed, replaced by a row of punctures. Length 2.5 to 3 mm.

This species bears a very close resemblance to *fulvipennis*, but differs from it in the presence of the basal marginal line of prothorax. Horn was in error when he said that *lateralis* did not have the lateral marginal line extended. Occurs in Alaska

(Horn) and in California from San Diego northward, both coastal and inland.

CERCYON ADUMBRATUS Mannerheim

Oval, shining, variable in color from piceo-testaceous to piceous, but with the sides of thorax and elytral apex indefinitely paler; body beneath piceous, opaque; legs rufo-testaceous. Head moderately coarsely, not closely punctate; disk of prothorax moderately punctate, punctures finer in front and almost obsolete at the sides. Elytra striate, the tenth stria obsolete, striæ deeper at sides and apex, those of the disk scarcely visibly punctate, those at sides distinctly so, intervals of the disk not distinctly punctate. Mesosternal elevation very narrow, but with a distinctly punctate edge. Length 2 to 2.5 mm.

This species varies in color greatly, resembling *fulvipennis*, *lateralis*, and *hæmorrhoidalis*, but differs from all in the almost entire absence of interstrial punctation. Taken by Van Dyke from under dead grass at edge of beach along Alaskan coast. It occurs from Alaska southward to Vancouver and Washington.

CERCYON HÆMORRHOIDALIS Fabricius

Oval, piceous; elytra piceo-castaneous, brownish or somewhat paler, the apex usually paler than the disk; epipleuræ pale; body beneath black, opaque; legs piceo-rufous, femora darker. Head rather coarsely and closely punctate. Prothorax entirely piceous, surface closely punctate. Elytra ten-striate, the tenth stria replaced by a row of punctures, striæ distinct at apex, moderately closely punctate, intervals flat, densely punctulate, more sparsely at the sides and apex. Metasternal area extended by a line directed toward the outer front angles. Mesosternal elevation elongate-lanceolate, not sulcate, punctate. Length 2.5 to 3 mm.

This species varies in the color of the elytra from piceous to castaneous, but has usually a narrow dark border along the base, which extends along the suture nearly to apex. Taken at Paraiso Springs and Carmel (Slevin), California.

CERCYON PYGMÆUS Illiger

Oval, piceous black, elytra piceo-rufous, or paler, with a large triangular basal space of variable extent and a humeral stripe piceous; prothorax entirely piceous; epipleuræ pale; body beneath piceous, opaque; legs pale rufo-testaceous. Head distinctly, not closely punctate; usually a distinct prescutellar impression at base of prothorax, surface moderately closely, but not deeply punctate. Elytra striate, the tenth very indistinct, striæ punctate and deeper at base, intervals flat, sparsely indistinctly punctate, much more finely than the thorax. Metasternal area continued by a well ele-

vated line to the anterior angles. Mesosternal elevation very narrow, but punctate. Length 1.5 to 2 mm.

This species varies in the extent of the piceous triangle of the elytra, which may cover fully half the entire area or may be reduced to a small spot at the scutellum. Resembles *melanocephalus* but is always smaller. The punctation of the head is much less distinct than that of the thorax. Taken in Oregon and southern California by Blaisdell and Slevin.

CERCYON NIGRICEPS Marsham

Oval, piceous, shining, sides of thorax indefinitely paler; elytra reddish testaceous, with a common fuscous spot behind the middle; epipleuræ pale; body beneath, opaque black; legs rufo-testaceous. Head distinctly, not closely punctate. Basal marginal line of prothorax distinct at the side. Elytra moderately deeply striate, the tenth stria obliterated, striæ relatively coarsely punctate, the intervals slightly convex, scarcely distinctly punctate. Metasternal area prolonged by an elevated line to the anterior angles. Mesosternal elevation linear, smooth. Length 1.5 to 2 mm.

In many specimens the metasternal area is pale. Our smallest species. Rare. Taken at San Diego (Blaisdell) and Pomona, California.

CERCYON OPACELLUS Fall

Oval, narrower behind, piceous black, subopaque; elytra finely alutaceous, at apex with a well defined pale space extending along the side margin; thorax piceous, near the side margin indistinctly paler; body beneath opaque black; legs rufo-testaceous. Head moderately finely, closely punctate. Surface of prothorax more distinctly impressed at sides and apex, the tenth stria wanting, striæ finely punctate on the disk, more coarsely and closely at sides, intervals flat, alutaceous, not distinctly punctate. Mesosternal elevation very narrowly oval, punctate. Length 1.5 mm.

Recorded by Horn, as *lugubris*, from California and Nevada.

CERCYON TRISTIS Illiger

Oval, very convex, distinctly narrower behind, black, subopaque, alutaceous; elytra with an apical pale space; prothorax piceous, shining, sometimes with a slight pale space at anterior angle; body beneath opaque black, legs rufo-testaceous. Head shining, distinctly and moderately closely punctate. Surface of prothorax relatively coarsely punctate, a little closer at middle than at the sides. Elytra distinctly alutaceous and subopaque, the striæ replaced by rows of fine punctures not closely placed, which are almost entirely obliterated at the sides and apex, intervals flat, obsoletely punctate near the base only. Mesosternal elevation lanceolate. Length 1.5 mm.

Recorded by Horn from California, Washington and Nevada.

CERCYON KULZERI Knisch

Oval, elongate, piceous, tip and posterior margins of elytra and anterior angles of prothorax yellow; entire dorsal surface shining though entirely alutaceous; legs pitch brown or reddish, tibiæ and tarsi red or yellowish red. Head very finely and sparsely punctured. Punctuation of prothorax similar to head; elytra with ten moderately fine striæ, tenth fainter; punctures of striæ coarser at sides, less distinct at apex. Intervals more strongly punctate than thorax. Mesosternal elevation about twice as long as wide, rounded at the ends, distinctly and moderately closely punctate. Length 1.5 to 1.8 mm.

This species is characterized by the alutaceous upper surface; by the elytral intervals being finely but more strongly and distinctly punctured than the thorax; and by the wide surface of the mesosternal elevation. Recorded by Knisch from California. Taken from Lassen County to San Diego, California (Blaisdell, Martin, Van Dyke, Fall).

CERCYON RUFESCENS Horn

Oval, convex, rufescent, moderately shining. Head and thorax sparsely finely punctate. Elytra without impressed striæ but with rows of punctures not closely placed, the eighth, ninth, and tenth rows with the punctures deeper and closer for part of their length; intervals flat, equal in width, irregularly biserially punctate, more distinctly than prothorax. Metasternal area not well defined. Mesosternum oval, acute in front, coarsely punctured. Length 2 mm.

Close to *tristis* and *kulzeri*, but distinguished by its completely pale color. Described by Horn from Sierra San Lazaro, Lower California.

CERCYON NAVICULARIS Zimmermann

Oval, narrower posteriorly, piceous black, shining; elytra slightly rufescent at tip and along the suture posteriorly; body beneath piceous, shining, sparsely punctate; legs rufo-testaceous. Head sparsely, finely and indistinctly punctate. Prothorax almost absolutely smooth, a few sparse and fine punctures near the sides. Elytra very convex, rapidly declivous posteriorly, the sutural region slightly elevated on the declivity; surface with striæ of very fine punctures, which are, however, more distinct at side and apex, the interstitial spaces very sparsely punctate. Metasternal area with a fine but distinct oblique line. Mesosternal elevation lanceolate, longitudinally sulcate; metasternum in front truncate. Length 1.5 mm. or a little longer.

The presence of the oblique metasternal line and the shining underside will readily distinguish this species from any other *Cercyon*. Recorded by Horn from California.

Group MEGASTERNI

The side pieces of the metasternum are partly covered by the elytra so as to be much narrowed. The middle coxæ are widely, almost entirely, separated by a large pentagonal mesosternal area. Metasternum not or very little prolonged between the coxæ and very closely united with the mesosternum, the suture scarcely visible. Prosternum at middle elevated to the plane of the mesosternum forming an area. First ventral segment carinate.

Two genera occur on this coast and are separated by the characters given in the foregoing table.

Genus MEGASTERNUM Mulsant

Maxillary palpi with last segment distinctly longer than the penultimate. Prosternum elevated, forming a somewhat hexagonal area, which rather widely separates the anterior coxæ, meeting the mesosternum and having a notch in its posterior margin. Middle coxæ widely separated by a process formed partly of the metasternum and partly of the mesosternum, the latter being in the form of a broadly pentagonal plate, acute in front, the union between these two sterna being very close, although with a distinct suture. Anterior tibiæ deeply notched on the outer edge near the apex.

Only one species has been recorded from this coast, though six are known and two occur in the United States. The genus occurs also in Europe, Asia, Japan, and Alaska.

MEGASTERNUM POSTICATUM Mannerheim

Oval, slightly narrower behind, convex, piceous, sides of prothorax and humeral spot indefinitely paler; elytra at apex distinctly paler; body beneath piceous, slightly shining; legs rufo-piceous. Head smooth, shining, entirely piceous. Basal marginal line of prothorax absent, surface smooth, shining, a few sparsely placed, very fine punctures near the side. Elytra finely alutaceous, surface finely striate, striæ deeper near the apex, the punctures of the striæ deeper near the apex, intervals flat, not punctate. Length 2 mm.

Genus CRYPTOPLEURUM Mulsant

Fourteen species of *Cryptopleurum* are known from the Pacific area and Europe, four of them occur in the United States, but only one species has been reported from our Pacific Coast.

CRYPTOPLEURUM UNICOLOR Motschulsky

Oval, convex, punctulate, rufous; palpi long; thorax transverse, narrowed in front, laterally arcuate; elytra striate, the striæ punctate; tibiæ spinose on exterior edge. Length, 2 mm.; width, 1.4 mm.

Taken at Sitka, Alaska.

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